State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Aquatic Resources
Honolulu, Hawaii 96813

June 12, 2009

Board of Land
and Natural Resources
Honolulu, Hawaii

Request for Authorization and Approval to Issue a Papahānaumokuākea Marine National Monument Research Permit to Dr. Randall Kosaki, National Oceanic and Atmospheric Administration, Papahānaumokuākea Marine National Monument, for Access to State Waters to Conduct Surveys of Deep Coral Reefs.

The Division of Aquatic Resources (DAR) hereby submits a request for your authorization and approval for issuance of a Papahānaumokuākea Marine National Monument research permit to Dr. Randall Kosaki, Deputy Superintendent, of the National Oceanic and Atmospheric Administration (NOAA), Papahānaumokuākea Marine National Monument, pursuant to § 187A-6, Hawaii Revised Statutes (HRS), chapter13-60.5, Hawaii Administrative Rules (HAR), and all other applicable laws and regulations.

The research permit, as described below, would allow entry and research activities to occur in Papahānaumokuākea Marine National Monument (Monument), including the NWHI State Marine Refuge and the waters (0-3 nautical miles) surrounding the following sites:

- Nihoa Island,
- Necker Island (Mokumanamana),
- French Frigate Shoals,
- Pearl and Hermes Atoll,
- Kure Atoll State Seabird Sanctuary

The activities covered under this permit will occur from August 1, 2009 through September 30, 2009.

INTENDED ACTIVITIES

The applicant proposes to explore and document the biodiversity of the Monument's deep coral reefs, which includes documenting the presence or absence of alien/invasive species in deep reef ecosystems. While the primary focus of the surveys would be detecting invasive snowflake coral and red algae (which are spreading within the main Hawaiian Islands), divers would also opportunistically begin a characterization of the fish fauna of deep coral reefs in the NWHI.

To carry out these activities, the applicant proposes using conventional and technical SCUBA diving technology. Dives would range between 10-35m in depth using conventional SCUBA, and between 35-90m using technical trimix. This would allow access to "Mesophotic Coral

Ecosystems" (MCEs) which are recognized to have diverse and unique flora and fauna, but remain largely unexplored. Technical dives would be conducted under NOAA auspices and would conform to the regulations for the NOAA Dive Center.

Visual surveys for snowflake coral (*Carijoa riisei*) and red algae (*Hypnea musciformis*) would be conducted in areas of high-probability habitat as determined by habitat suitability models. At the same time, divers would make note of fish encountered during the dives. The applicant proposed collecting voucher specimens of the targeted invasive species if found (3/dive site/species), as well as any unidentifiable fish which may represent new geographic records or species (3/island or atoll/species).

While other monitoring programs exist in the NWHI, they are conducted primarily in the range of 10-20m. The target species for the activities described above are most abundant in depths of 30-100m, and are therefore unlikely to be encountered by existing surveys. The proposed work would establish a presence-or-absence baseline for these species. As such, the activities proposed by the applicant directly support the Monument Management Plan's priority management needs in the Alien Species action plan 3.3.2. The strategies and activities which make up action plan 3.3.2 specifically address the surveillance of red algae and snowflake coral.

The activities described above may require the following regulated activities to occur in State waters:

- ☒ Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving monument resource
- ☒ Anchoring a vessel
- ☒ Touching coral, living or dead
- ☒ Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

REVIEW PROCESS:

The permit application was sent out for review and comment to the following scientific and cultural entities: Hawaii Division of Aquatic Resources, Hawaii Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office, and the Office of Hawaiian Affairs (OHA). In addition, the permit application has been posted on the Monument Web site since March 12th, giving the public an opportunity to comment. The application was posted within 40 days of its receipt, in accordance with the Monument's Public Notification Policy.

Comments received from the scientific community are summarized as follows:

Scientific reviews support the acceptance of this application.

Concerns raised were:

1. How applicant ensures that collections of only new species will be made

2. If personnel would be trained on field identification of target organisms

Comments received from the Native Hawaiian community are summarized as follows:

Cultural reviews support the acceptance of this application. No concerns were raised.

Comments received from the public are summarized as follows:

No comments were received from the public on this application.

Additional reviews and permit history:

Are there other relevant/necessary permits or environmental reviews that have or will be issued with regard to this project? (e.g. MMPA, ESA, EA) Yes ☒ No ☐
If so, please list or explain:

- The proposed activities are in compliance with the National Environmental Policy Act.

Has Applicant been granted a permit from the State in the past? Yes ☒ No ☐
If so, please summarize past permits:

- The applicant was granted permit PMNM-2007-048 in 2007.

Have there been any a) violations: Yes ☐ No ☒
b) Late/incomplete post-activity reports: Yes ☐ No ☒

Are there any other relevant concerns from previous permits? Yes ☐ No ☒

RESPONSE:

1. The applicant states that fish collection would only occur when a biologist with a high level of familiarity with these fishes is present. These would be Richard Pyle, Ray Boland, and Randy Kosaki. Other deep dives for alien/invasive species would continue without fish collections if these personnel are not in the water.

2. The applicant points out that the NOAA PMNM alien/invasive species expert is coordinating training by local experts (Dr. Celia Smith and others) in ID of alien algae. In addition, Tony Montgomery (the local expert on the problem of Carijoa overgrowing antipatharian corals) will be participating in the cruise. He will train participants in Carijoa identification. Lead divers on the project (Kosaki, Pyle, Boland, Montgomery) are already very familiar with these organsisms.

STAFF OPINION:

DAR staff is of the opinion that Applicant has properly demonstrated valid justifications for his application and should be allowed to enter the NWHI State waters and to conduct the activities therein as specified in the application with the following special instructions and conditions, which are in addition to the Papahānaumokuākea Marine National Monument Conservation and Management Permit General Conditions. The following special conditions have been vetted through the legal counsel of the Co-Trustee agencies.

1. This permit is not to be used for nor does it authorize the sale of collected organisms. Under this permit, the authorized activities must be for noncommercial purposes not involving the use or sale of any organism, by-products, or materials collected within the Monument for obtaining patent or intellectual property rights.

2. The permittee may not convey, transfer, or distribute, in any fashion (including, but not limited to, selling, trading, giving, or loaning) any coral, live rock, or organism collected under this permit without the express written permission of the Co-Trustees.

3. To prevent introduction of disease or the unintended transport of live organisms, the permittee must comply with the disease and transport protocols attached to this permit.

4. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.

5. Refueling of tenders and all small vessels must be done at the support ships and outside the confines of lagoons or near-shore waters in the State Marine Refuge

6. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional and customary practices by Native Hawaiians.

MONUMENT MANAGEMENT BOARD OPINION:

The MMB is of the opinion that the Applicant has met the findings of Presidential Proclamation 8031 and this activity may be conducted subject to completion of all compliance requirements. The MMB concurs with the special conditions recommended by DAR staff.

RECOMMENDATION:

"That the Board authorize and approve, with stated conditions, a Research Permit to Dr. Randall Kosakai, Papahānaumokuākea Marine National Monument."

Respectfully submitted,

DAN POLHEMUS
Administrator

APPROVED FOR SUBMITTAL

LAURA H. THIELEN
Chairperson

Papahānaumokuākea Marine National Monument

RESEARCH Permit Application

NOTE: ***This Permit Application (and associated Instructions) are to propose activities to be conducted in the Papahānaumokuākea Marine National Monument. The Co-Trustees are required to determine that issuing the requested permit is compatible with the findings of Presidential Proclamation 8031. Within this Application, provide all information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Papahānaumokuākea Marine National Monument (Monument).***

ADDITIONAL IMPORTANT INFORMATION:

- Any or all of the information within this application may be posted to the Monument website informing the public on projects proposed to occur in the Monument.

- In addition to the permit application, the Applicant must either download the Monument Compliance Information Sheet from the Monument website OR request a hard copy from the Monument Permit Coordinator (contact information below). The Monument Compliance Information Sheet must be submitted to the Monument Permit Coordinator after initial application consultation.

- Issuance of a Monument permit is dependent upon the completion and review of the application and Compliance Information Sheet.

INCOMPLETE APPLICATIONS WILL NOT BE CONSIDERED

Send Permit Applications to:
Papahānaumokuākea Marine National Monument Permit Coordinator
6600 Kalaniana'ole Hwy. # 300
Honolulu, HI 96825
nwhipermit@noaa.gov
PHONE: (808) 397-2660 FAX: (808) 397-2662

SUBMITTAL VIA ELECTRONIC MAIL IS PREFERRED BUT NOT REQUIRED. FOR ADDITIONAL SUBMITTAL INSTRUCTIONS, SEE THE LAST PAGE.

Papahānaumokuākea Marine National Monument
Permit Application Cover Sheet

This Permit Application Cover Sheet is intended to provide summary information and status to the public on permit applications for activities proposed to be conducted in the Papahānaumokuākea Marine National Monument. While a permit application has been received, it has not been fully reviewed nor approved by the Monument Management Board to date. The Monument permit process also ensures that all environmental reviews are conducted prior to the issuance of a Monument permit.

Summary Information

Applicant Name: Randall Kosaki, Ph.D.
Affiliation: NOAA/NOS/ONMS/Papahanaumokuakea Marine National Monument

Permit Category: Research
Proposed Activity Dates: August 6-September 4, 2009
Proposed Method of Entry (Vessel/Plane): NOAA Ship HI`IALAKAI
Proposed Locations: Nihoa, Necker, French Frigate Shoals, Pearl and Hermes, Midway, Kure, others TBD

Estimated number of individuals (including Applicant) to be covered under this permit: 11
Estimated number of days in the Monument: 25

Description of proposed activities: (complete these sentences):
a.) The proposed activity would...
The proposed activities would use conventional and technical SCUBA diving technology to commence exploration and documentation of the biodiversity of the NWHI's deep coral reefs, as well as to document the presence or absence of alien/invasive species in these deep reef ecosystems. Of primary interest are surveys for the presence or absence of the invasive octocoral Carijoa riisei, and the invasive red alga Hypnea musciformis. These invasive species are spreading in the Main Hawaiian Islands, and are considered a serious threat to the southeastern end of the NWHI (Godwin et al. 2006, See 2007). An ancillary project to be opportunistically conducted while divers are at depth is to begin a characterization of the fish fauna of deep coral reefs in the NWHI.

Pacific coral reefs host greater macroscopic biodiversity than any other marine habitat (Pyle 1995, Reaka-Kudla 1997, Myers 1999). Photosynthetic corals have recently been documented to a depth of at least 165 m in the Pacific; yet only the upper 30 m is well studied (e.g., Pyle 1996, 1998). Like tropical rainforest canopies before 1970, deeper reefs are largely unexplored, and the biodiversity at depths of 30-200 m (more than 80% of the depth range of coral-reef habitat) remains almost completely unknown.

These "Mesophotic Coral Ecosystems" (MCEs) have recently been prioritized for study, due to a growing realization that the flora and fauna are both diverse and unique, and also face growing threats. Perhaps most ominously, these reefs occur at the lower limit of the aragonite saturation zone in much of the Pacific (Guinotte et al. 2006), and may be especially vulnerable to ocean acidification. The World Conservation Union (IUCN) has identified this ecosystem as a top conservation priority for reef fishes (Sadovy 2007). The biodiversity of these MCEs is threatened before its documentation has begun in earnest. We therefore propose to address both issues, and will for the first time characterize the MCE fish fauna of the NWHI while simultaneously conducting surveys for the invasive species most likely to impact these deep reef ecosystems.

b.) To accomplish this activity we would ....

To accomplish the primary activity, we would conduct technical trimix dives from small boats supported by NOAA ship Hi'ialakai. The barrier to exploring MCEs has been technological. The vast majority of research on shallow coral reefs in the NWHI and elsewhere has been conducted with conventional SCUBA, but safe and meaningful scientific research with this gear has been confinedmostly to the shallowest 30 m of reef habitat. Likewise, remote sampling methods (traps and trawls) have proven ineffective for sampling this complex rocky coral-reef environment (Dennis & Aldhous 2004). Deep-sea submersibles have been used to examine marine life at depths of 30-200 m in the tropical Pacific (e.g., Hills-Colinvaux 1986, Thresher & Colin 1986, Kahng & Maragos 2006), but they typically cost $20,000-$60,000 per day, and are rarely deployed in remote tropical Pacific regions. Furthermore, submersibles are ill-suited to collect cryptic species typical of the reef environment. Low densities of Hypnea and Carijoa would most likely go undetected by submersible observers.

The depths of our proposed dives would range between 10-35m in depth (conventional SCUBA), and 35-90 m (trimix). Visual surveys for Hypnea and Carijoa will be conducted in areas of high-probability habitat as determined by habitat suitability modeling now being conducted by NOAA's National Centers for Coastal and Ocean Science (NCCOS) Bioegeography team. If the invasive species in question are found, not more than three voucher specimens per dive site will be collected for taxonomic identification and genetic characterization by scientists at the University of Hawaii. Collections of Carijoa are also (redundantly) covered under a 2009 PMNM research permit application submitted simultaneously by Dr. Rob Toonen of the Hawaii Institute of Marine Biology. Analysis of these specimens will occur at HIMB.

To accomplish the secondary acitivity (fish biodiversity), divers will make presence/absence notes on fishes encountered during the invasive species survey dives. The ultimate goal of these checklists will be a published, island-by-island checklist of fishes known from the deep reefs of the NWHI. If fish species are encountered that are not readily identifiable, or may represent a new geographic record or new species, up to three voucher specimens per island/reef/atoll will be collected.

c.) This activity would help the Monument by ...

The primary activity would help the Monument by establishing a presence-or-absence baseline at the island groups intermediate in location between the Main Hawaiian Islands (presumed source of these invasive species) and the rest of the NWHI. Nihoa and Mokumanama are the two islands/banks that are the most likely gateway or stepping stones for invasive species from the MHI to the NWHI. Carijoa is abundant in the waters of Maui County and Oahu, and also occurs on Kauai (Godwin et al. 2006, See 2007). It is known to overgrow black coral colonies and associated substrata in the Auau Channel (and elsewhere in the MHI). It has not yet been detected in the NWHI, but small colonies have been seen at Kaula Rock, Five Fathom Pinnacle, and Niihau, all of which are geographically intermediate between the MHI and NWHI (Montgomery, personal communication). Although existing monitoring programs in the NWHI, e.g. RAMP (Reef Assessment and Monitoring Program) survey for all taxa and will record alien or invasive species when encountered, most of these surveys are conducted between 10 and 20 m depth. Carijoa is most abundant in 30-100 m depth, and in the NWHI, Hypnea is only known from depths exceeding 35 m at Mokumanamana. Thus, existing surveys are unlikely to encounter either species. If detected at an early stage of colonization and spread, eradication may be a possibility (e.g. pilot Carijoa eradication project in Nawiliwili Harbor on Kauai).

Other information or background:

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Kosaki, Randall K.

Title: Deputy Superintendent, NOAA/ONMS Papahanaumokuakea Marine National Monument

1a. Intended field Principal Investigator (See instructions for more information):
same (Randall Kosaki)

2. Mailing address (street/P.O. box, city, state, country, zip): [redacted]

Phone: [redacted]

Fax: [redacted]

Email: [redacted]

For students, major professor's name, telephone and email address:

3. Affiliation (institution/agency/organization directly related to the proposed project):
NOAA/NOS/ONMS Papahanaumokuakea Marine National Monument

4. Additional persons to be covered by permit. List all personnel roles and names (if known at time of application) here (e.g. John Doe, Research Diver; Jane Doe, Field Technician):
Kelly Gleason, Ph.D., Research Diver, NOAA PMNM, kelly.gleason@noaa.gov
Elizabeth Keenan, M.S., Research Diver, NOAA PMNM, elizabeth.keenan@noaa.gov
Randall Kosaki, Ph.D., Research Diver, NOAA PMNM
Ray Boland, Research Diver, NOAA NMFS PIFSC
Tony Montgomery, Research Diver, State of Hawaii DLNR
Corinne Kane, M.S., Research Diver, State of Hawaii DLNR
Richard Pyle, Ph.D., Research Diver, B.P. Bishop Museum
Greg McFall, M.S., Research Diver, NOAA Grays' Reef National Marine Sanctuary
Tane Casserly, M.S., Research Diver, NOAA Thunder Bay National Marine Sanctuary
Yannis Papastamatiou, Ph.D., Research Diver, Hawaii Inst. of Marine Biology
Research Diver, TBD
contact info for field personnel is attached separately

Section B: Project Information

5a. Project location(s):

		Ocean Based	
☒ Nihoa Island	☐ Land-based	☒ Shallow water	☐ Deep water
☒ Necker Island (Mokumanamana)	☐ Land-based	☒ Shallow water	☐ Deep water
☒ French Frigate Shoals	☐ Land-based	☒ Shallow water	☐ Deep water
☐ Gardner Pinnacles	☐ Land-based	☐ Shallow water	☐ Deep water
☐ Maro Reef			
☐ Laysan Island	☐ Land-based	☐ Shallow water	☐ Deep water
☐ Lisianski Island, Neva Shoal	☐ Land-based	☐ Shallow water	☐ Deep water
☒ Pearl and Hermes Atoll	☐ Land-based	☒ Shallow water	☐ Deep water
☒ Midway Atoll	☐ Land-based	☒ Shallow water	☐ Deep water
☒ Kure Atoll	☐ Land-based	☒ Shallow water	☐ Deep water
☐ Other			

NOTE: There is a fee schedule for people visiting Midway Atoll National Wildlife Refuge via vessel and aircraft.

Location Description:

5b. Check all applicable regulated activities proposed to be conducted in the Monument:

☒ Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving Monument resource

☐ Drilling into, dredging, or otherwise altering the submerged lands other than by anchoring a vessel; or constructing, placing, or abandoning any structure, material, or other matter on the submerged lands

☒ Anchoring a vessel

☐ Deserting a vessel aground, at anchor, or adrift

☐ Discharging or depositing any material or matter into the Monument

☒ Touching coral, living or dead

☐ Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument

☐ Attracting any living Monument resource

☐ Sustenance fishing (Federal waters only, outside of Special Preservation Areas, Ecological Reserves and Special Management Areas)

☐ Subsistence fishing (State waters only)

☒ Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

6 Purpose/Need/Scope ***State purpose of proposed activities:***
The proposed activities will support PMNM Management Plan's Alien Species Action Plan (ASAP) by conducting active surveillance to detect and monitor alien species (AS 2.1); development of alien species detection and monitoring protocols (AS 2.3), mapping the invasive red alga Hypnea musciformis (AS 7.1), and surveillance of the snowflake coral Carijoa riisei (AS 7.2). In addition, the deep reef fish assessments will conduct activities identified in the PMNM Management Plan's Marine Conservation Science Action plan to "develop baseline inventory of the biological resources and biodiversity of deep reefs... using all available technologies, including ... remotely operated vehicles (ROVs), and technical diving."

7. Answer the Findings below by providing information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Monument:

The Findings are as follows:

a. How can the activity be conducted with adequate safeguards for the cultural, natural and historic resources and ecological integrity of the Monument?
No activities will be performed in the vicinity of known cultural or historical resources. If any such resources are discovered in the course of these proposed activities, their location(s) will be noted and reported to appropriate authorities. Our survey activities will cease immediately, and will be continued in another area.

Biological sampling for the primary activity (invasive species surveys) will be limited to small numbers of voucher specimens for taxonomic ID and genetic analysis. Removal of alien /invasive species is generally considered to be beneficial to the ecosystem, habitat, and native organisms. Care will be taken to individually bag samples to preclude facilitation of reproduction or dispersal via fragmentation.

If potential new records or new species of fishes are encountered, they will be sampled via HD video, pole spear, or hand nets. All three of these methods have virtually no potential for collateral damage. No poisons or explosives will be used. These methods are highly selective, and thus no damage to the habitat or accidental take of non-target species will occur.

b. How will the activity be conducted in a manner compatible with the management direction of this proclamation, considering the extent to which the conduct of the activity may diminish or enhance Monument cultural, natural and historic resources, qualities, and ecological integrity, any indirect, secondary, or cumulative effects of the activity, and the duration of such effects?

c. Is there a practicable alternative to conducting the activity within the Monument? If not, explain why your activities must be conducted in the Monument.

In order to investigate the spatial distribution of invasive species in the Monument, surveys must be conducted in the Monument. In order to document deep reef fish biodiversity in the Monument, these surveys must also be conducted in Monument waters.

d. How does the end value of the activity outweigh its adverse impacts on Monument cultural, natural and historic resources, qualities, and ecological integrity?
Invasive species surveys and related sampling will have virtually no impacts on native species, natural resources, or ecological integrity. Removal of alien or invasive species is instead beneficial to the ecosystem. If new records or new species of fishes are encountered, the minimal number of voucher species per island (three) is neglible compared to the importance of increasing our understanding of the biodiversity, biogeographic affinities, and levels of endemism of these reef communities. Having this very basic level of information on biodiversity is one of the cornerstones of responsible management.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.
Given the large areas of deep reef habitat that remain unexplored and uncharacterized, there is no way that this first preliminary effort could be regarded as "longer than necessary." It will be minimally adequate to enable a qualitative comparison of the abundance of alien/invasive species with the heavily infested MHI, and the (presumably) more pristine NWHI. These sites will provide baselines that can be revisited at points in the future to determine what the status and trends of the environement are with regard to this potential problem

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.
I have conducted visual qualitative and quantitative surveys of coral reef benthic and fish fauna for over 25 years. I was one of the original founding instructors of the University of Hawaii's national award-winning marine transect course, Quantitative Underwater Ecological Sampling Techniques (QUEST). I first conducted marine life surveys in the NWHI in 1982, and have been integrally involved in planning and executing the NWHI Reef Assessment and Monitoring Program (RAMP) cruises since their inception in 2000. The invasive species surveys proposed here occur in deeper water than most previous surveys. I have logged nearly 1000 decompression dives on air, nitrox, and trimix to depths of up to 300 feet. The dive operations will be run by Ray Boland (Unit Diving Supervisor, NMFS PIFSC) and Greg McFall (Line Office Dive Officer, National Ocean Service). Both are the most highly trained technical divers within their respective NOAA line offices. Tony Montgomery (State DLNR), who will be participating in these surveys, already conducts similar surveys for the State using closed-circuit rebreathers. Richard Pyle (BP Bishop Museum), is one of the most highly respected experts in the world on the application of mixed gas breathing technologies to deep coral reef research. Pyle is also the foremost expert on the taxonomy of deep coral reef fishes.

g. Provide information demonstrating that you have adequate financial resources available to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.
The project is funded in part by NOAA NCCOS funds to the State DLNR. These funds will support acquisition of gas mixes for diving. NOAA/NOS/PMNM will also support the project

with it's allocation of ship time aboard NOAA R/V HI`IALAKAI, as well as with in-kind support (salary for staff) and contracts to the B.P. Bishop Museum for taxonomic and curatorial assistance. NOAA ships, and activities conducted off of them, are considered to be self-insured by the Federal government.

h. Explain how your methods and procedures are appropriate to achieve the proposed activity's goals in relation to their impacts to Monument cultural, natural and historic resources, qualities, and ecological integrity.
The proposed methods limit the number of specimens taken to the minimum number that will ensure accurate taxonomic identification. The numbers required will be many orders of magnitude below that which would produce a measurable or biologically significant impact to the ecological integrity of the Monument. As noted earlier, the removal of invasive species is generall considered to be beneficial to the environment. Wherever possible, specimens will used for additional studies (genetics) or will be added to museum collections as reference/voucher specimens where they will be available to all researchers. There will be no interaction will cultural or historical resources.

i. Has your vessel has been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?
Yes.

j. Demonstrate that there are no other factors that would make the issuance of a permit for the activity inappropriate.
There are no other factors that would make issuance of a permit inappropriate under the Proclamation and its Findings section. The sample sizes are very small, the information potentially gained is invaluable to managers, and the people recruited to staff this project are among the very best in the world when it comes to characterization of deep reefs.

8. Procedures/Methods:
Technical diving will be conducted under NOAA auspices, and will conform to the regulations of the NOAA Dive Center. Dive sites will be determined in advance through habitat suitability modeling based on bathymetry. Divers will enter the water from, and be recovered by, the primary dive platform, an 11m Ambar boat (HI-1) launched from the starboard davit aboard Hi`ialakai. HI-1 will also have on board a backup diver with full SCUBA gear who will be available to assist the primary divers with bottle swaps, etc., during decompression. The dive team and primary dive boat will be shadowed by a 19' SAFEboat chase boat, which will have on board a backup technical diver with a full technical trimix rig. The chase boat will be available to follow a separate lift bag or float should the members of the primary dive pair become separated. Both boats will be operated by dedicated coxswains who will not be diving. Boats will be within clear radio range of Hi`ialakai at all times.

The primary dive team will be dropped on pre-determined sites. All dives will be conducted while live-boating, i.e. no anchoring. Bottom times of 25 minutes or less are expected in waters

over 200'. No dives in excess of 300' will be conducted. During the dive, divers will take still and video records of habitat type and abundant species, as well as conduct searches in open areas and under ledges or overhangs for Hypnea and Carijoa. If encountered, depth/time will be recorded, which will allow an approximate spatial fix to be established based on the support boat's GPS track. Approximate greatest dimensions of invasive colonies will be recorded, and specimens (<5cm greatest dimension) will be collected either by hand or with metal clippers. Specimens will be placed in sealed bags and will be carried to the surface with the divers. If any fishes are collected, they will be placed in sealed "dry bags," and may be sent to the surface via a lift bag for the chase boat to recover. Decompression times of less than 45 minutes are expected, and decompression will be conducted while drifting in blue water. A lift bag or float will enable the support boats to remain in close proximity to the divers at all times.

A Deep Ocean Engineering ROV (remotely operated vehicle) may be opportunistically used from Hi`ialakai to ground-truth bathymetry and confirm bottom conditions at potential dive sites.

NOTE: If land or marine archeological activities are involved, contact the Monument Permit Coordinator at the address on the general application form before proceeding, as a customized application will be needed. For more information, contact the Monument office on the first page of this application.

9a. Collection of specimens - collecting activities (would apply to any activity): organisms or objects (List of species, if applicable, attach additional sheets if necessary):

Common name:
Snowflake coral
Red algae
Deep reef fishes TBD

Scientific name:
Carijoa riisei
Hypnea musciformis

& size of specimens:
If either Hypnea or Carijoa are encountered, three specimens per species per dive site will be collected. Maximum specimen size will be 5 cm in greatest dimension.

If potential new records or new species of fishes are encountered, a maximum of three specimens per island, bank, or atoll will be collected. Maximum size dependent on size of the fish (whole specimen collected).

Collection location:
Nihoa, Necker, Mokumanama, French Frigate Shoals, Pearl and Hermes, Midway, Kure

Specific latitude/longitude of dive sites will be determined by NCCOS habitat suitability models, and weather.

☒ Whole Organism ☒ Partial Organism

9b. What will be done with the specimens after the project has ended?
Specimens will be given to the University of Hawaii, Hawaii Institute of Marine BIology, and the B.P. Bishop Museum for positive identification. Additional genetic studies will be performed by the Hawaii Institute of Marine Biology. Fish specimens will be added to the Indo-Pacific fishes reference collection at the BP Bishop Museum.

9c. Will the organisms be kept alive after collection? ☐ Yes ☒ No

• General site/location for collections:
TBD. Generally, the highest probability for encountering Hypnea and Carijoa is in deeper waters between 35 and 100 m. Some surveys will be conducted in less than 30 m, as in shallow-water habitats characterized by boulders and overhangs, Carijoa may be found in these shaded, sheltered recesses. However, since RAMP surveys have not noted these species in the NWHI, it seems unlikely that any will be collected in less than 30 m. Habitat suitability models (utilizing existing multibeam bathymetry) that take into account depth ranges, bottom type (hard/soft), rugosity, and slope are being generated by NOAA NCCOS. These will be completed before the cruise, and will be used to target highest probability areas for encountering Hypnea or Carijoa.

Similarly, since the shallow (<30 m) reefs have been regularly surveyed for reef fish species presence and abundance, it is unlikely that any new records or new species will be recorded or collected in that depth range. It seems more likely that new discoveries will be made in deeper waters that have not been surveyed by regular monitoring programs.

• Is it an open or closed system? ☐ Open ☐ Closed
N/A

• Is there an outfall? ☐ Yes ☐ No
N/A

• Will these organisms be housed with other organisms? If so, what are the other organisms?
N/A

• Will organisms be released?
N/A

10. If applicable, how will the collected samples or specimens be transported out of the Monument?

Specimens of Carijoa will be fixed and tranpsorted under a permit (pending) to Dr. Rob Toonen of the Hawaii Institute of Marine Biology. Specimens of Hypnea, as well as any reef fish, will be triple-bagged, labeled, and frozen per the conditions of the Monument Specimen Transport Protocol.

11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:
Specimens will be shared with HIMB for molecular analayses (particularly Carijoa, but also fishes), and the BP Bishop Museum (for their reference collection of Indo-Pacific coral reef fishes).

12a. List all specialized gear and materials to be used in this activity:
Technical dive gear, including helium-oxygen-nitrogen compressed gas breathing mixes, and nitrox or 100% oxygen decompression mixes. All collecting will be done either by hand (Carijoa, Hypnea) or hand nets or pole spears (fishes).

12b. List all Hazardous Materials you propose to take to and use within the Monument:
N/A

13. Describe any fixed installations and instrumentation proposed to be set in the Monument:
N/A

14. Provide a time line for sample analysis, data analysis, write-up and publication of information:
Sample analysis will begin upon return to Honolulu. Continued collections are anticipated in 2011 and 2012 at islands and atolls that were not visitied in 2009-10. Although preliminary written results will be made available within one year of return, a final analysis and publication will not be initiated until a larger number of islands have been surveyed.

15. List all Applicants' publications directly related to the proposed project:
CV attached

LIterature Cited:

Dennis, C. & Aldhous, P. 2004. A tragedy with many players. Nature 430: 396-398.

Godwin, S., K.S. Rodgers and P.L. Jokiel. 2006. Reducing potential impact of invasive marine species in the northwestern hawaiian islands marine national monument. Report to: Northwest Hawaiian Islands Marine National Monument Administration.

Guinotte, J.M., Buddemeier, R.W., Kleypas, J.A. 2003. Future coral reef habitat marginality: temporal and spatial effects of climate change in the Pacific basin. Coral Reefs 22:551-558.

Hills-Colinvaux, L. 1986. Deep water populations of Halimeda in the economy of an atoll. Bull. Mar. Sci. 38(1):155-169.

Kahng, S. E. & J.E. Maragos. 2006. The deepest, zooxanthellate scleractinian corals in the world? Coral Reefs 25(2): 254.

Myers, R.F. 1999. Micronesian reef fishes: a comprehensive guide to the coral reef fishes of Micronesia. Third edition, revised and expanded. Coral Graphics, Barrigada, Guam. vi + 330 p., 192 pls.

Pyle, R.L. 1995. Chapter 12. Pacific reef and shore fishes, p. 205-238. In: Maragos, J.E., Peterson, M.N.A., Eldredge, L.G., Bardach, J.E. & Takeuchi, H.F. (eds.), Marine and coastal biodiversity in the tropical island Pacific region. Volume 1. Species systematics and information management priorities. Program on Environment, East-West Center, Honolulu. 424 p.

Pyle, R.L. 1996. How much coral reef biodiversity are we missing? Global Biodiversity 6(1): 3-7.

Pyle, R.L. 1998. Chapter 7. Use of advanced mixed-gas diving technology to explore the coral reef "Twilight Zone", p. 71-88. In: Tanacredi, J.T. & Loret, J. (eds.), Ocean Pulse: A Critical Diagnosis. Plenum Press, New York. xii + 201 p.

Sadovy, Y. 2007. Final Report: Workshop for Global Red List Assessments of Groupers Family Serranidae; subfamily Epinephelinae (http://www.hku.hk/ecology/GroupersWrasses/iucnsg/). University of Hong Kong.

See, Kevin. 2007. Report on the marine invasive species in Papahanaumokuakea Marine National Monumnent. Report to NOAA/NOS Papahanaumokuakea Marine National Monument. 27 pp. Sept. 2007

Thresher, R.E. & Colin, P.L. 1986. Trophic structure, diversity, and abundance of fishes of the deep reef (30-300 m) at Enewetak, Marshall Islands. Bull. Mar. Sci. 38(1): 253-272.

With knowledge of the penalties for false or incomplete statements, as provided by 18 U.S.C. 1001, and for perjury, as provided by 18 U.S.C. 1621, I hereby certify to the best of my abilities under penalty of perjury of that the information I have provided on this application form is true and correct. I agree that the Co-Trustees may post this application in its entirety on the Internet. I understand that the Co-Trustees will consider deleting all information that I have identified as "confidential" prior to posting the application.

Signature Date

SEND ONE SIGNED APPLICATION VIA MAIL TO THE MONUMENT OFFICE BELOW:

Papahānaumokuākea Marine National Monument Permit Coordinator
6600 Kalaniana'ole Hwy. # 300
Honolulu, HI 96825
FAX: (808) 397-2662

DID YOU INCLUDE THESE?

☒ Applicant CV/Resume/Biography
☐ Intended field Principal Investigator CV/Resume/Biography
☐ Electronic and Hard Copy of Application with Signature
☐ Statement of information you wish to be kept confidential
☐ Material Safety Data Sheets for Hazardous Materials

Papahānaumokuākea Marine National Monument
Compliance Information Sheet

1. Updated list of personnel to be covered by permit. List all personnel names and their roles here (e.g. John Doe, Diver; Jane Doe, Field Technician, Jerry Doe, Medical Assistant): Randy Kosaki, Research Diver; Kelly Gleason, Research Diver; Elizabeth Keenan, Research Diver; Ray Boland, Research Diver; Tony Montgomery, Research Diver; Corrine Cane, Research Diver; Richard Pyle, Research Diver; Greg McFall, Research Diver; Yannis Papastamatiou, Research Diver; Research Divers, TBD.

2. Specific Site Location(s): (Attach copies of specific collection locations): General site location will be in the shallow waters of Nihoa Island, Necker Island, French Frigate Shoals, Pearl and Hermes Atoll, Midway Atoll and Kure Atoll. Specific locations will be determined when on site using bathymetry, depth soundings, as well as possibly the results of transects run by ROV, to determine dive sites with appropriate habitat.

3. Other permits (list and attach documentation of all other related Federal or State permits):

3a. For each of the permits listed, identify any permit violations or any permit that was suspended, amended, modified or revoked for cause. Explain the circumstances surrounding the violation or permit suspension, amendment, modification or revocation. N/A

4. Funding sources (Attach copies of your budget, specific to proposed activities under this permit and include funding sources. See instructions for more information): The project is funded in part by NOAA NCOSS funds to the state DLNR. These funds will support acquisition of the mixed gases for diving operations. The project is further funded by NOAA NOS PMNM by the provision of ship time on board the NOAA ship Hi'ialakai as well as in kind support of salary and staff, and Support from Bishop Museum for sample curation and taxonomic assistance.

5. Time frame:
Activity start: August 1, 2009
Activity completion: December 1, 2009

Dates actively inside the Monument:

From: August 8, 2009
To: September 7, 2009

Describe any limiting factors in declaring specific dates of the proposed activity at the time of application: The cruise dates have shifted slightly since the original application was submitted due to changes in ship scheduling, and it is possible that they could shift again by a few days in either direction.

Personnel schedule in the Monument: All personnel listed are currently scheduled to be on board the cruise for the duration of the cruise. Any updates or changes to personnel lists or schedules will be reported in a timely manner to the monument staff.

6. Indicate (with attached documentation) what insurance policies, bonding coverage, and/or financial resources are in place to pay for or reimburse the Monument trustees for the necessary search and rescue, evacuation, and/or removal of any or all persons covered by the permit from the Monument: NOAA ships and the activities conducted off of them are considered to be self insured by the Federal Government.

7. Check the appropriate box to indicate how personnel will enter the Monument:

☒ Vessel
☐ Aircraft

Provide Vessel and Aircraft information: NOAA Ship Hi'ialakai

8. The certifications/inspections (below) must be completed prior to departure for vessels (and associated tenders) entering the Monument. Fill in scheduled date (attach documentation):

☐ Rodent free, Date:
☐ Tender vessel, Date:
☐ Ballast water, Date:
☐ Gear/equipment, Date:
☐ Hull inspection, Date:

9. Vessel information (NOTE: if you are traveling aboard a National Oceanic and Atmospheric Administration vessel, skip this question):
Vessel name:

Vessel owner:
Captain's name:
IMO#:
Vessel ID#:
Flag:
Vessel type:
Call sign:
Embarkation port:
Last port vessel will have been at prior to this embarkation:
Length:
Gross tonnage:
Total ballast water capacity volume (m3):
Total number of ballast water tanks on ship:
Total fuel capacity:
Total number of fuel tanks on ship:
Marine Sanitation Device:
Type:

Explain in detail how you will comply with the regulations regarding discharge in the Monument. Describe in detail. If applicable, attach schematics of the vessel's discharge and treatment systems:

Other fuel/hazardous materials to be carried on board and amounts:

Provide proof of a National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement-approved Vessel Monitoring System (VMS). Provide the name and contact information of the contractor responsible for installing the VMS system. Also describe VMS unit name and type:

VMS Email:
Inmarsat ID#:

* Individuals MUST ENSURE that a type-approved VMS unit is installed and that its automatic position reports are being properly received by the NOAA OLE system prior to the issuance of a permit. To make sure your VMS is properly configured for the NOAA OLE system, please contact NOAA OLE at (808) 203-2503 or (808) 203-2500.

* PERMITS WILL NOT BE ISSUED TO INDIVIDUALS ENTERING THE MONUMENT VIA VESSEL UNTIL NOAA OLE HAS CONTACTED THE MONUMENT PERMIT COORDINATOR WITH A 'POSITIVE CHECK' READING.

10. Tender information:

On what workboats (tenders) will personnel, gear and materials be transported within the Monument? List the number of tenders/skiffs aboard and specific types of motors: We will be using the Hi'ialakai's small boats as well as PMNM's safeboat, which include:

HI-1: 10m Ambar jetboat RIB with diesel Yanmar engine
Hi-2: 8m Ambar jetboat RIB with diesel Yanmar engine
HI-5: 16ft Zodiac inflatable with 50 HP Honda engine
Kaku: 19ft Safeboat with twin 90 Honda engines

Additional Information for Land Based Operations

11. Proposed movement of personnel, gear, materials, and, if applicable, samples: All will be moved on board the Hi'ialakai. Samples will be shared with HIMB for genetic research, and with Bishop Museum for their collection.

12. Room and board requirements on island: N/A

13. Work space needs: N/A

DID YOU INCLUDE THESE?

- ☐ Map(s) or GPS point(s) of Project Location(s), if applicable
- ☐ Funding Proposal(s)
- ☐ Funding and Award Documentation, if already received
- ☐ Documentation of Insurance, if already received
- ☐ Documentation of Inspections
- ☐ Documentation of all required Federal and State Permits or applications for permits